

## Satellite Remote Sensing & GIS for Rainfall-Runoff Modelling

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## Case Study

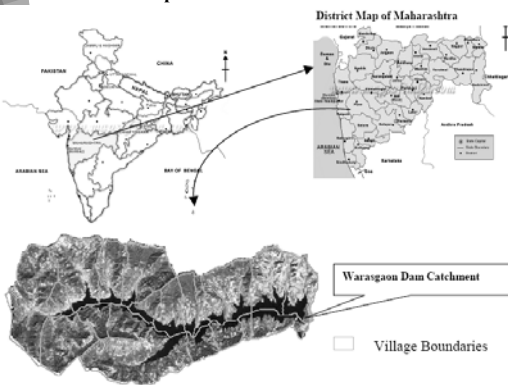
*Estimation of Surface Runoff for  
Warasgaon Dam Catchment*

*Mose river (near Pune)*

Source

Estimation of Surface Runoff using Rainfall – Runoff Modeling of Warasgaon Dam Catchment  
A. A. Kulkarni, S.P. Aggarwal and K.K.Das  
Map India Conference 2004, GIS Development, New Delhi

### Location Map



## Materials and Methods

- Satellite images of IRS – IC LISS III (4th February 2002) & IRS – IC PAN (30th January 2002) were used for land use/land cover mapping
- Digital Elevation Model (DEM) was created using contour map for deriving slope map of Mose river catchment in GIS domain.

### Modified Soil Conservation Services (SCS)

#### Model

- The **runoff** is estimated with help of following equation

Where,

$$Q = \frac{(P - I_a)^2}{(P - I_a + S)}$$

Q = Accumulated storm runoff, mm.

P = Accumulated storm rainfall, mm.

$I_a$  = Initial abstraction, ( $\approx 0.2S$ )

S = Maximum Potential retention by the soil.

- For daily rainfall, S values are derived from the CN values using the following formula as

$$S = 25.4 \left( \frac{1000}{CN} - 10 \right)$$

Where, CN is function of watershed hydrologic land use/land cover units, hydrologic soil groups and antecedent moisture conditions

### Methodology for Rainfall – Runoff Modeling

